

Emerging Technology Program (ETP) of the
U.S. EPA's Superfund Innovative
Technology Evaluation (SITE) Program

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THE EMERGING TECHNOLOGY PROGRAM (ETP) OF THE
U.S. EPA'S SUPERFUND INNOVATIVE TECHNOLOGY
EVALUATION (SITE) PROGRAM

by

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16. ABSTRACT The Emerging Technology Program offers a mechanism for performing joint technology development between the private sector and the U.S. Environmental Protection Agency (EPA) with the goal of shortening the time period from "proof of concept" to actual technology use at a Superfund site. The Emerging Technology Program is intended to assist in further developing bench/laboratory scale innovative technologies to the pilot-scale, so that they may become candidates for the full-scale demonstration program. Technologies to remove, treat or detoxify either hazardous organic compounds, inorganic compounds, or mixtures of both in all media, but particularly soils and sludges, are of interest to the program. Candidate technologies must show promise for commercialization but must not yet be at the field demonstration stage of development.		
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The U.S. Environmental Protection Agency (EPA) is engaged in an initiative called the Superfund Innovative Technology Evaluation (SITE) program. This program offers a mechanism for performing technology demonstrations and evaluations or for technology development activities between the private sector and EPA with the goal of shortening the period from "proof of concept" to technology commercialization.

The overall goal of the SITE Program is to ensure that innovative technologies are developed, demonstrated, and made commercially available for the permanent cleanup of Superfund sites. The Agency wants to replace reliance on land disposal and removal options wherever it is technically feasible. The SITE Program consists of two separate technology programs. The first, the demonstration program, places emphasis on field-scale alternative technologies which have been successfully developed to the extent that a demonstration will lead to commercializations. The second, the Emerging Technology Program (ETP) is intended to assist in developing bench/laboratory scale innovative technologies through pilot-scale level so that they are ready for field demonstration.

The Emerging Technologies Program is intended to develop innovative technologies for recycling, separation, detoxification, destruction, and stabilization of hazardous wastes at Superfund sites. Candidate technologies must show promise for commercialization but must not yet be at the field demonstration stage of development. The goal is to ensure that a steady stream of effective technologies will be available for demonstration, thereby increasing the number of viable alternatives available for use in Superfund site cleanup. Private developers with technologies to remove, treat or detoxify either hazardous organic compounds, inorganic compounds, or mixtures of both in soils and sludges, and material handling and separation technologies are sought to be participants in the program. The 1988 solicitation will emphasize technologies that can handle complex mixtures of hazardous organic and inorganic contaminants in sludges and soils by either in situ or surface processes that separate, remove, destroy, detoxify or stabilize the contaminants or provide for improved solids handling and pretreatment.

Under this program, financial assistance is provided by EPA to the private sector to share risk associated with proving the developers' technologies. This program provides the framework and infrastructure to encourage development of innovative approaches in hazardous waste management. The ETP will provide funding through competitively awarded Cooperative Agreements to technology developers. Cooperative Agreements are vehicles by which the Environmental Protection Agency can enter into jointly-funded projects with technology developers. Cooperative Agreements require contributions from both parties (the developer and EPA). There is a difference in the funded Cooperative Agreements between the Demonstration

Program and the Emerging Technology Program. In the Demonstration Program, the Developer pays all costs associated with the set-up and operation of his technology at a Superfund site. The EPA pays all costs associated with monitoring, sampling and analysis, QA/QC, evaluation and assessment of the performance of the developer's technology. In the Emerging Technology Program, the Developer receives financial assistance directly from EPA to help develop his technology through the pilot-scale level. For example, the developer may use these funds for equipment, sampling and analysis, QA/QC, personnel costs, etc. If successful scale up is accomplished under the ETP, the proven pilot scale technology may then become an eligible candidate for field evaluation under the SITE Demonstration program. The ETP will make available to any individual technology developer a maximum of \$300,000 over 2 years (\$150,000/year). In order to obtain the second year funding, EPA will analyze and review the first year progress on the project to see if significant progress has been made. This is a very critical point in the technical review process of the program. The Developer has to have a very well thought out and executed project accomplishment plan with some data collection the first year, so that EPA can make an informed decision whether to fund the second year of the project.

The Evaluation Criteria that appeared in last year's Emerging Technology Program Solicitation RFP-E01, is as follows:

1. Technical Description of Technology:

Describe and discuss the technology; indicate types of hazardous wastes that can be destroyed or detoxified; indicate waste media

such as water, sediment, effluent sludge, soil or air. Describe whether it is applicable only to hazardous organic and inorganic compounds (such as toxic metals) (specify which ones), and whether it can be applied to mixtures of organics and inorganics. Also, describe any residuals which may be generated.

2. Description of Proposed Project:

Describe and discuss the proposed project in regard to level of clean-up of hazardous wastes; characterization and handling of hazardous waste control process train residues and wastes,

3. Summary of Data Results to Date:

Describe and discuss previous test experience and data results in bench-, and/or laboratory-scale experiments. Indicate level of success that has been achieved and indicated QA/QC parameters used to ensure credibility of data results.

4. Estimated Resources (Funding) Needed for Proposed Project:

Provide estimated costs for project, equipment, operations and maintenance of technology, labor, and for sampling and analysis QA/QC and reporting, etc.

5. Company and Personnel Experience:

Describe the level of relevant developmental work experience of key personnel for the proposed program. Describe and discuss the extent to which the Developer will dedicate time of key personnel to the proposed program.

6. Value of Technology to Superfund Program:

Provide a short description explaining the potential value of the Developer's technology to the Superfund/Hazardous Waste

Programs and why EPA should be interested in using this technology, if proven, for the permanent clean-up of Superfund sites. Be as specific as possible. Failure to sufficiently address this factor may result in rejection of the preproposal.

There were 84 preproposals received in response to the SITE Emerging Technology Program, RFP No. E01. The preproposals were classified as follows:

Biological Treatment Processes	16
Chemical Treatment Processes	24
Geological Repositories	1
Incineration/Thermal Processes	17
Physical Treatment Processes	20
Solidification/Stabilization	<u>6</u>
Total	84

This was a very good response to the program's first year solicitation.

The 20 preproposals received addressing physical treatment processes can be further classified into the following categories.

Filtration	3
Membrane Processes	3
Electroacoustic Fields	3
Solvent Extraction	2
Air Stripping	1
Electrocoagulation	2
Lead Battery Recycling	1

Freeze Crystalization	1
Adsorption	1
In-Situ Aeration	1
Robotics	1
Leaching	<u>1</u>
Total	20

The preproposals were technically reviewed by two extramural reviewers, Hazardous Waste Engineering Research Laboratory staff, and Office of Solid Waste and Office of Emergency and Remedial Response staff in Headquarters.

Fifteen were invited to submit Cooperative Agreement Applications to HWERL for further consideration under stage two of the technical review process:

Biological Treatment Processes	3
Chemical Treatment Processes	4
Incineration/Thermal Treatment	3
Physical Treatment Processes	4
Solidification/Stabilization	<u>1</u>
Total	15

Based on the resources available for FY'88, EPA plans to fund about half of the applications by the end of the Federal fiscal year (September 30, 1988).

While completing the funding actions for selected applicants under the first solicitation, EPA will initiate the second solicitation

announcement (SITE-E02) in May, 1988. The issue date for the RFP will be July, 1988. All requests for RFP SITE-E02 must be made in writing to William Frietsch III (MS-466), SITE Emerging Technology Program, U.S. Environmental Protection Agency, Cincinnati, OH 45268.